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EXAMINER

IRVIN, THOMAS W

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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DETAILED ACTION

Claim Objections

Claims 1, 2, and 6 are objected to because of the following informalities: the claim language regarding the links having “two through-holes of different configurations” appears to be incorrect as the through-holes appear to merely be of different shape or size. “Configuration” relates to an arrangement of parts. With reference to fig. 2 of applicant’s drawings, the pins (3) and strips (5) all appear to be in the same configuration, as well as the placement of the through-holes (4) in the links (2). Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5-8, 11, 12, 15, 16, 18, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Rooij et al. (5,728,021) in view of Anpo (JP 01-169149).

In Re claims 1, 2, 11, and 21, Van Rooij et al. discloses a power transmission chain entrainable between a first pulley possessing conical sheave surfaces (65) and a second pulley possessing conical sheave surfaces (67), the power transmission chain

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(31) comprising a plurality of links (33,53) each possessing through-holes (35,37), and a plurality of pins (45) and strips (47) inserted through the through-holes for interconnecting the plural links, the power transmission chain transmitting power by way of contact between opposite end faces of the each of the pins and the sheave surfaces of the first and second pulleys, wherein all the plurality of pins substantially have the same length in the longitudinal direction (see Fig. 3). Van Rooij et al. further disclose two through holes (35,37) of different configurations (see fig. 4, 6, and 7). Van Rooij et al. fail to teach plural types of pins with different areas and rigidities in the longitudinal direction.

Anpo teaches including, in a power transmission chain, a plurality of types of pins (12a₂, 12b₂, 12c₂) having different areas and rigidities in the longitudinal direction thereof. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the power transmission chain of Van Rooij et al. to include a plurality of types of pins, as taught by Anpo, to reduce and randomize the chordal action caused by the contact between the pins and links, and pins and strips, of the power transmission chain. The examiner notes that rigidity is based, in part, on an area, and therefore the differing cross-sectional surface areas of the pins mean that the different pins have different rigidities.

In Re claims 3 and 12, in the chain as modified, a first group of pins (12a₂) of the plurality of pins have substantially the same sectional shape and sectional area, and a second group of pins (12b₂) have a different sectional area than the first group of pins, and a third group of pins (12c₂) have even a different sectional area.

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In Re claims 5, 15, and 16, the sectional area of a groups of pins (12a,12b,12c) appear to be between 1.1 and 2 times the sectional area of a the other groups of pins (see Figs. 8-10 of Anpo).

In Re claims 6, 8, and 18, Van Rooij et al. disclose a power transmission chain (31) entrainable between a first and second pulley possessing conical sheave surfaces (see Fig. 5) and transmitting power by way of contact between opposite end faces of plural chain friction transmission members (45) and the sheave surfaces (65,67) of the first and second pulleys, the chain friction transmission members arranged along a chain longitudinal direction at predetermined space intervals, the chain comprising a plurality of links (33,53) each possessing first and second through-holes (35,37) arranged in the chain longitudinal direction, and a plurality of first pins (45) and a plurality of strips (47), each of which penetrate the first through-hole of one link and the second through-hole of another other link thereby interconnecting the links, adjoining in a chain widthwise direction, in a manner to provide bending in the chain longitudinal direction, wherein the pins are fixed in the first through-hole of the one link and movably fitted in the second through-hole of the other link, and also movably fitted in the first through-hole of the one link and fixed in the second through-hole of the other link, so as to be brought into relative movement in rolling contact thereby permitting the bending of the chain. The pins include an involute of a circle (see col. 2, lines 15-18, and col. 5, lines 37-57). Van Rooij et al. further disclose two through holes (35,37) of different configurations (see fig. 4, 6, and 7). Van Rooij et al. fail to disclose plural types of first pins.

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Anpo teaches making a power transmission chain (50) with several types of pins (12a,12b,12c) randomly installed throughout the chain. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the first pins of Van Rooij et al. to have included several different types of pins, as taught by Anpo, to further reduce and randomize the chordal action caused by the contact between the pins and links, and the pins and strips, of the power transmission chain. The examiner notes that rigidity is based, in part, on an area, and therefore the differing cross-sectional surface areas of the pins in the chain, as modified, mean that the different pins have different rigidities.

In Re claim 7, see friction transmission members (45) of Van Rooij et al. (fig. 3).

In Re claims 22-24, see end faces (84) of strips (47) shown in fig. 5 of Van Rooij et al. not contacting the sheave faces, and col. 5, lines 14-17. Additionally, the examiner notes that the claims are drawn to the chain only, and not the power transmission, and therefore the limitations regarding the pulley have not been given patentable weight.

Claims 4, 10, 13, 14, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Rooij et al. (5,728,021) in view of Anpo (JP 01-169149) as applied to claims 1, 2, and 6 above, and further in view of Zimmer (4,718,880).

Van Rooij et al., as modified, fail to teach links having differing pitches.

Zimmer teaches, with reference to Fig. 9, arranging links (68a,70a,72a), with differing pitches, randomly in a chain (see col. 1 and 2, lines 60-15). It would have been

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obvious to one of ordinary skill in the art at the time the invention was made to have modified the chain of Van Rooij et al. as modified, to include links of differing pitches, as taught by Zimmer, to lessen the noise of the chain against the sheaves, without affecting the tensional strength of the chain.

In Re claim 17, the sectional area of a groups of pins (12a,12b,12c) appear to be between 1.1 and 2 times the sectional area of a the other groups of pins (see Figs. 8-10 of Anpo).

Response to Arguments

Applicant's arguments filed 09 July 2010 have been fully considered but they are not persuasive.

In response to applicant's arguments that Anpo teaches away from the claimed "two through-holes of different configurations", the examiner points out that the holes of the links of Van Rooij et al. were not modified by those of Anpo in the previous rejection; the examiner's use of the Anpo reference was related to providing a plurality of pins. Additionally, the examiner points to figs. 4, 6, and 7 of Van Rooij et al. which shows the claimed two-through holes (35,37) of different configurations.

In response to applicant's arguments that the pins of Anpo do not transmit the force, the examiner points to the above rejections, in which Anpo is merely utilized to teach modifying the single shape of the pins of Van Rooij et al. to reduce and randomize the chordal action caused by the contact between the pins and links, and pins and strips, of the power transmission chain. As previously stated, the motivation to modify

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the pins of Van Rooij et al. to include plural size pins is found on page 4 of the translation (previous included) of the Anpo reference:

“However, there is a problem with the conventional transmission belt as described above, in that a large amount of noise occurs during driving. In other words, the opposing faces of all of the rocker pins and joint pins have identical radiuses of curvature and they vibrate at the opposing faces, so the circumferential speed of the transmission belt varies with a fixed cycle. Therefore, when the transmission belt is wound on a pulley and rotated the noise level becomes high at a prescribed frequency. To solve such a problem there is a method whereby the rocker pins and joint pins are provided with two or more radiuses of curvature, so that when the transmission belt is wound on a pulley the periodicity of the change in the circumferential speed of the transmission belt is reduced. Thus, the peak level of noise of a prescribed frequency can be reduced. “

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS IRVIN whose telephone number is (571)270-3095. The examiner can normally be reached on M-F 10-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272-7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas Irvin/
Examiner, Art Unit 3657

/Bradley T King/
Primary Examiner, Art Unit 3657